

Claims.

1. Inverter type motor drive unit for feeding AC electric power of variable parameters to an electric motor, comprising an electronic control section (40), a power converting and output section controlled by the control section (40), two input terminals (25,26) for connection to a DC power source, and three output terminals (32,33,34) for delivering a 3-phase AC power to an electric motor, characterized in that the power converting and output section comprises

- one or more identical power modules (11a-c) each comprising a complete 3-phase output stage,
- said power module or modules (11a-c) are multiplied by a suitable number and interconnected in parallel to meet the power demand of the actual motor size,
- said power module or modules (11a-c) are mounted side by side in a multiplying direction (A) on a cooling structure (10), thereby covering a certain surface area substantially corresponding in size to the surface area covered by the actual number of power modules (11a-c),
- said power module or modules (11a-c) are connected to said DC input terminals (25,26) and said AC output terminals (32,33,34) via conductive layers (20,21,27a-c) which are electrically insulated from each other and extend substantially in parallel with said cooling structure (10) and covering substantially all of said certain surface area.

2. Motor drive unit according to claim 1, wherein one of said conductive layer (27a-c) is divided into three separate leads (27a-c) extending in parallel to each other across said power modules (11a-c) in said multiplying direction (A) and connecting said power module or modules (11a-c) in parallel to said AC output terminals (32,33,34).

3. Motor drive unit according to claim 1 or 2, wherein all of said conductive layers (20,21,27a-c) comprise separate metal sheets, and a number of retaining devices (14) are arranged both to connect said metal sheets (20,21,27a-c) to said power module or modules (11a-c) and to clamp said power module or modules (11a-c) into a physical heat transferring contact with said cooling structure (10).

4. Motor drive unit according to claim 3, wherein two of said metal sheets (20,21) are connected to said DC input terminals (25,26), and said power module or modules (11a-c) are connected to capacitor banks (13a-c) via said two metal sheets (20,21).

5. Motor drive unit according to claim 3, wherein each one of said retaining devices (14) comprises a clamping member (16) and a distance piece (15) for locating each metal sheet (20,21,27a-c) at a specific distance from said power modules (11a-c), said distance pieces (15) are electrically conductive and serve to establish an electrical as well as thermal contact between said metal sheets (20,21,27a-c) and said power modules (11a-c).

6. Motor drive unit according to claim 5, wherein each one of said distance pieces (15) comprises a metallic tube element, and each one of said clamping members (16) comprises a screw extending axially through said tube element (15).

7. Motor drive unit according to anyone of claims 3-6, wherein the control section (40) comprises a circuit board (41) supported by at least one of said power module or modules (11a-c) in a parallel but spaced disposition relative to said metal sheets (20,21,27a-c) via contact devices (42) extending through apertures in said metal sheets (20,21,27a-c).

8. Motor drive unit according to anyone of claims 3 - 4, wherein said conductive metal sheets (20,21,27a-c) are insulated relative to each other by separate insulating sheets (19,30) of a non-conductive material sandwiched between said metal sheets (20,21,27a-c), and said metal sheets (20,21,27a-c) and said insulating sheets (19,30) are arranged and fixed in a stack by said clamping members (16) and said distance pieces (15).

9. Motor drive unit according to claim 8, wherein one or more guide elements (36a-c) of an insulating material are provided with stud portions (37a-c) which penetrate through openings in said metal sheets (20,21,27a-c) as well as said insulating sheets (19,30) to, thereby, locate said metal sheets (20,21,27a-c) and said insulating sheets (19,30) relative to each other prior to said metal sheets (20,21,27a-c) and said insulating sheets (19,30) being finally fixed by said clamping members (16) and said distance pieces (15) at mounting of said stack on said cooling structure (10).

10. Motor drive unit according to claim 1 or 2, wherein said conductive layers (20,21,27a-c) comprise separate metal sheets (20,21,27a-c), and said DC input terminals (25,26) and said AC output terminals (32,33,34) are located at opposite ends of said metal sheets (20,21,27a-c) in relation to said multiplying direction (A).

11. Motor drive unit according to anyone of claims 1-7, wherein a signal bus means (44a,b) extends across said power module or modules (11a-c) in said multiplying direction (A) and is arranged to connect said control section (40) to each one of said power module or modules (11a-c) and communicating signals between said control section (40) and said power module or modules (11a-c).

12. Motor drive unit according to claim 11, wherein said signal bus means (44a,b) comprises at least one circuit board (44a,b).